

HD74HC1G66

Analog Switch

REJ03D0188-0800Z
(Previous ADE-205-314F (Z))
Rev.8.00
Jan.27.2004

Description

The HD74HC1G66 is high-speed CMOS analog switch using silicon gate CMOS process. With CMOS low power dissipation, it provides high speed. The device has low ON resistance for good transfer characteristics and can take wide range of input voltage.

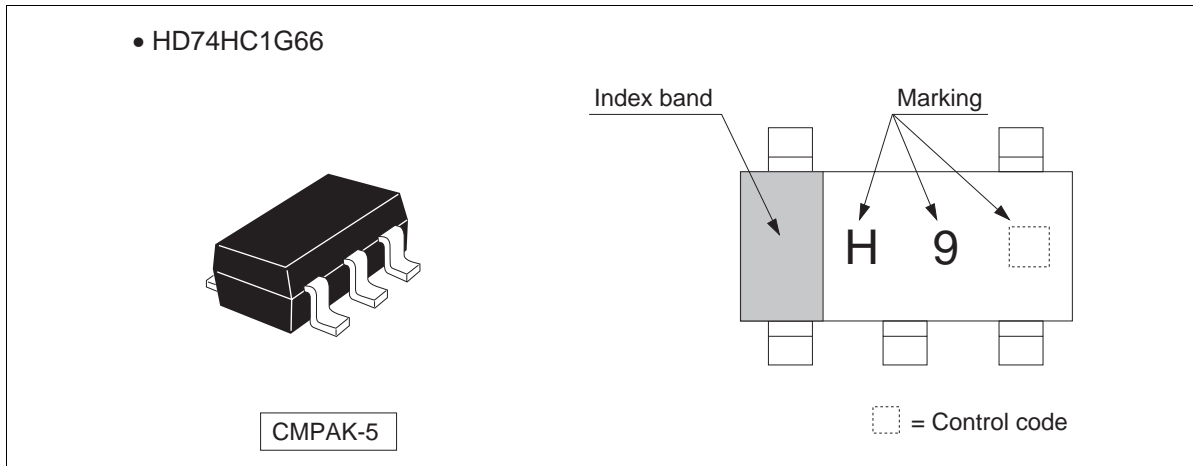
Features

- The basic gate function is lined up as Renesas uni logic series.
- Supplied on emboss taping for high-speed automatic mounting.
- Electrical characteristics equivalent to the HD74HC4066
Supply voltage range : 2 to 6 V
Operating temperature range : -40 to +85°C
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74HC1G66CME	CMPAK-5 pin	CMPAK-5A	CM	E (3,000 pcs/reel)

HD74HC1G66

Outline and Article Indication



Function Table

Control	Switch
L	OFF
H	ON

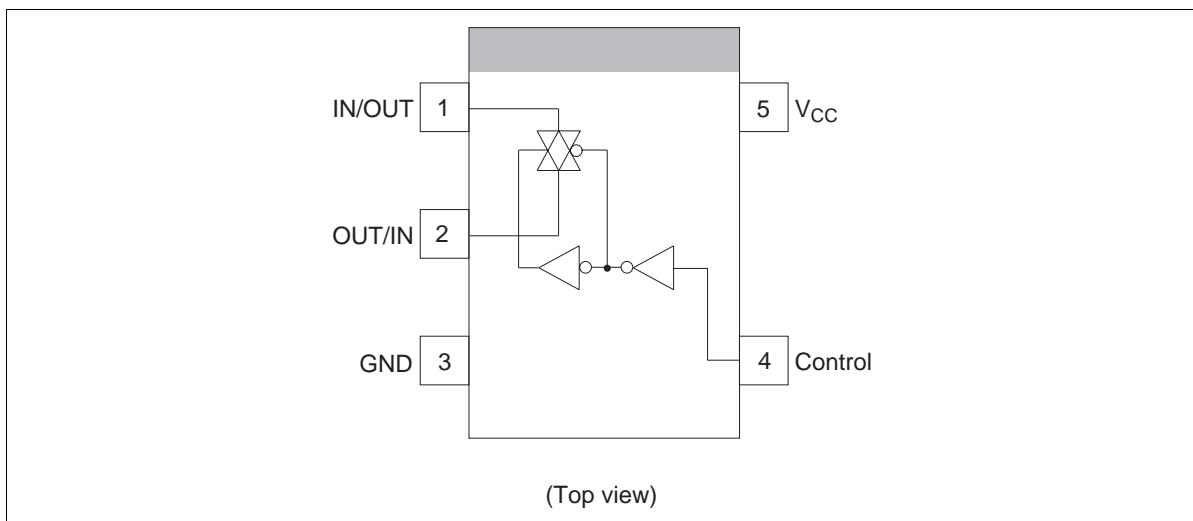
H : High level

L : Low level

$GND \leq V_{IN} \leq V_{CC}$

$GND \leq V_{OUT} \leq V_{CC}$

Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	V_{CC}	-0.5 to 7.0	V	
Input voltage range * ¹	V_I	-0.5 to $V_{CC} + 0.5$	V	
Output voltage range * ^{1,2}	V_O	-0.5 to $V_{CC} + 0.5$	V	Output : H or L
Input clamp current	I_{IK}	±20	mA	$V_I < 0$ or $V_I > V_{CC}$
Output clamp current	I_{OK}	±20	mA	$V_O < 0$ or $V_O > V_{CC}$
Continuous output current	I_O	±25	mA	$V_O = 0$ to V_{CC}
Continuous current through V_{CC} or GND	I_{CC} or I_{GND}	±25	mA	
Maximum power dissipation at $T_a = 25^\circ\text{C}$ (in still air) * ³	P_T	200	mW	
Storage temperature	T_{stg}	-65 to 150	°C	

Notes: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. This value is limited to 5.5 V maximum.
3. The maximum package power dissipation was calculated using a junction temperature of 150°C.

Recommended Operating Conditions

Item	Symbol	Min	Max	Unit	Test Conditions
Supply voltage range	V_{CC}	2	6	V	
Input voltage range	$V_{I/O}$	0	V_{CC}	V	
Output voltage range	V_O	0	V_{CC}	V	
Input rise / fall time (Control input 10% to 90%)	t_r, t_f	0	1000	ns	$V_{CC} = 2.0\text{ V}$
		0	500		$V_{CC} = 4.5\text{ V}$
		0	400		$V_{CC} = 6.0\text{ V}$
Operating temperature	T_a	-40	85	°C	

Note: Unused or floating control inputs must be held high or low.

Electrical Characteristics

Item	Symbo	V _{CC} (V)	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V	Control input only
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	V _{IL}	2.0	—	—	0.5	—	0.5		
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—	1.8		
On resistance	R _{ON}	2.0	—	200	450	—	550	Ω	V _C = V _{IH} V _{IN} = V _{CC} or GND I _T = 1 mA
		4.5	—	90	160	—	180		
		6.0	—	80	130	—	140		
Peak on resistance	R _{ON} (p)	2.0	—	600	1500	—	2000	Ω	V _C = V _{IH} V _{IN} = 0 to V _{CC} I _{IN/OUT} = 1 mA
		4.5	—	125	200	—	250		
		6.0	—	100	170	—	210		
Leak current	I _S (off)	6.0	—	—	±0.1	—	±1.0	μA	V _C = V _{IL} V _{IN} = V _{CC} , V _{OUT} = GND or V _{IN} = GND, V _{OUT} = V _{CC}
	I _S (on)	6.0	—	—	±0.1	—	±1.0	μA	V _C = V _{IH} V _{IN} = V _{CC} or GND
Input current	I _{IN}	6.0	—	—	±0.1	—	±1.0	μA	V _{IN} = V _{CC} or GND
Operating current	I _{CC}	6.0	—	—	1.0	—	10.0	μA	V _{IN} = V _{CC} or GND

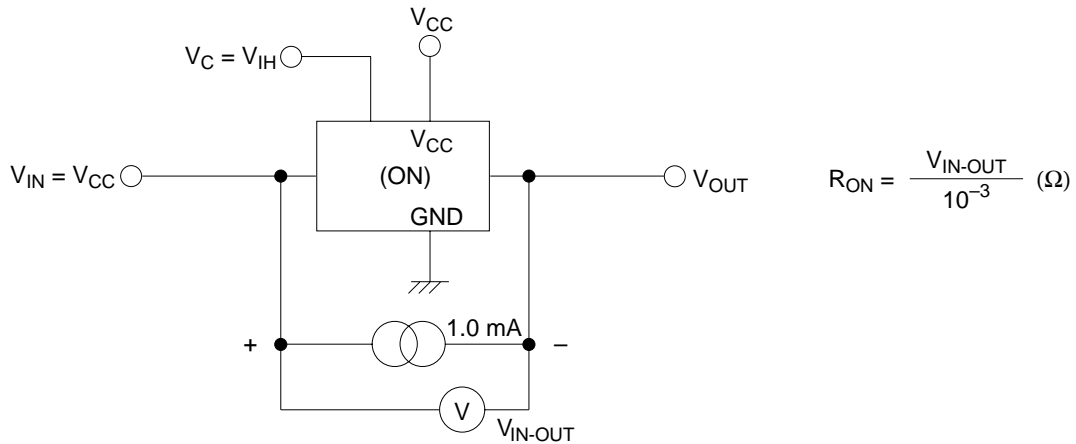
Switching Characteristics

Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t _{PLH} , t _{PHL}	2.0	—	—	50	—	65	ns	R _L = 10 kΩ
		4.5	—	4	10	—	13		
		6.0	—	—	9	—	11		
Output enable time	t _{ZH} , t _{ZL}	2.0	—	—	115	—	145	ns	R _L = 1 kΩ
		4.5	—	10	23	—	29		
		6.0	—	—	20	—	25		
Output disable time	t _{HZ} , t _{LZ}	2.0	—	—	115	—	145	ns	R _L = 1 kΩ
		4.5	—	14	23	—	29		
		6.0	—	—	20	—	25		
Maximum control frequency		2.0	—	20	—	—	—	MHz	
		4.5	—	30	—	—	—		
		6.0	—	30	—	—	—		
Control input capacitance	C _{IN}		—	2.5	5	—	5	pF	
Switch I/O capacitance	C _{IN/OUT}		—	2.5	—	—	—	pF	
Feed through capacitance	C _{IN-OUT}		—	0.5	—	—	—	pF	
Power dissipation capacitance	C _{PD}		—	5	—	—	—	pF	

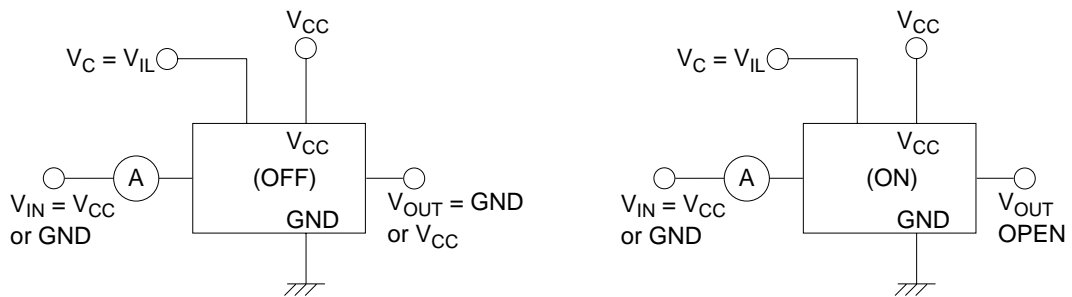
(C_L = 50 pF, t_r = t_f = 6 ns)

Test Circuit

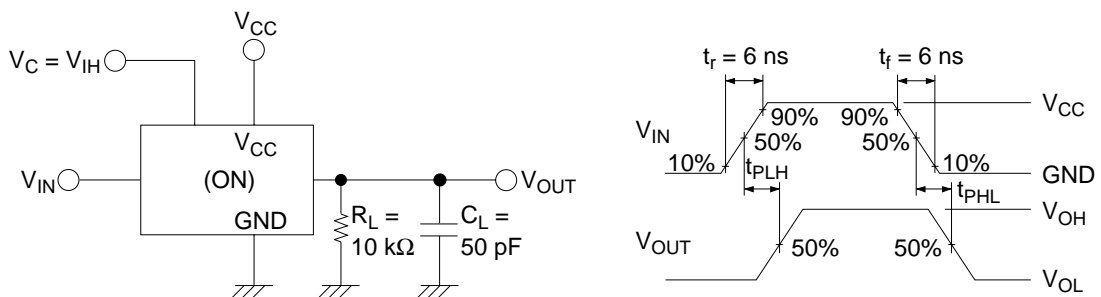
• R_{ON}



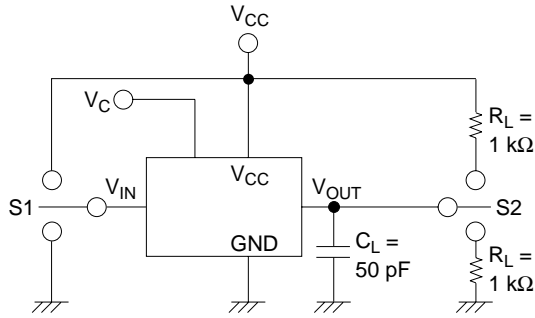
• I_S (off), I_S (on)



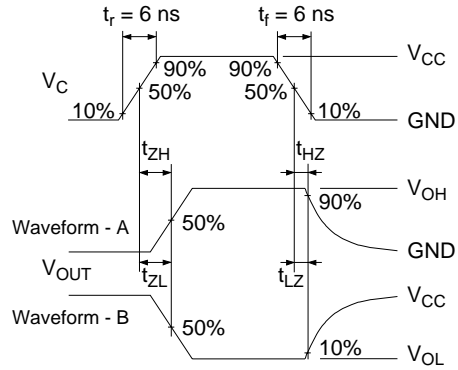
• t_{PLH} , t_{PHL}



• t_{ZH} , t_{ZL} / t_{HZ} , t_{LZ}

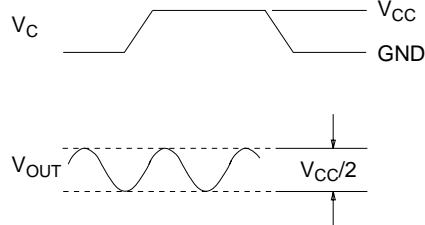
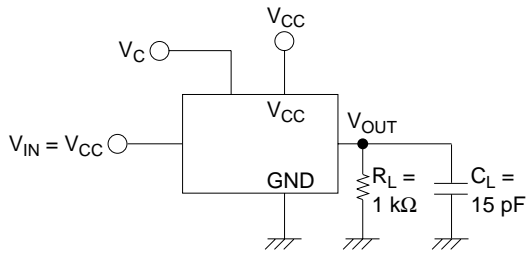


Item	S1	S2
t_{ZH}	V_{CC}	GND
t_{ZL}	GND	V_{CC}
t_{HZ}	V_{CC}	GND
t_{LZ}	GND	V_{CC}

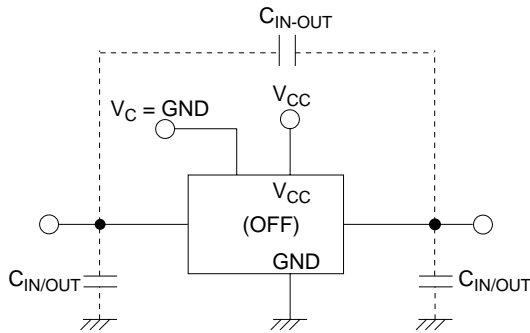


- Notes: 1. Waveform - A is for an output with internal conditions such that the output is high except when disabled by the output control.
 2. Waveform - B is for an output with internal conditions such that the output is low except when disabled by the output control.

• Maximum control frequency

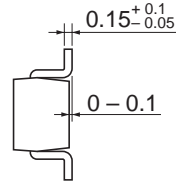
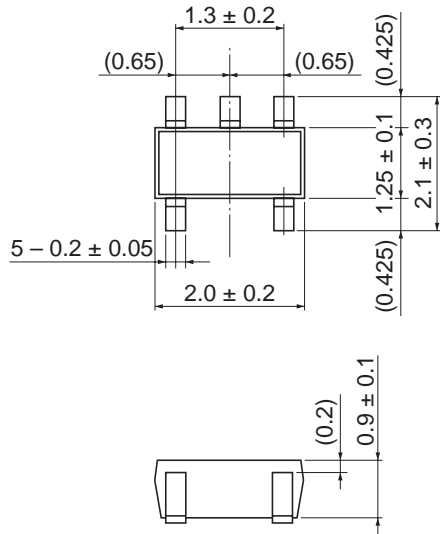


• $C_{IN/OUT}$, C_{IN-OUT}



Package Dimensions

Unit: mm



Package Code	CMPAK-5V
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.006 g

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